● PRINTER RUSH ●

IFW

(PTO ASSISTANCE)

Application : 10/678293 **Examiner :** Nguyen **GAU :** 2858

From: QF **Location:** [✓ IDC] FMF FDC **Date:** 3-4-05

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[RUSH] **MESSAGE:** Page 12, line 14 There's mention of Fig. 14, only one Fig in file.

Thank you
QF

[XRUSH] **RESPONSE:**

Page 12, line 14, FiG. 14 was a typo. error. It should be FiG. 1.
Examiner amended to correct error.

INITIALS: V.N

4/15/05

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REV 10/04

ity, dr/dt, the result is a change in the plate damping which may be either an increase or a decrease in the damping depending on the sign of the feedback signal. FIG 1 is a simplified schematic diagram of such a velocity feedback control which increases damping. When the plates are separating and dr/dt is positive the sign of i_b is negative according to Eq.20 and the output of differential amplifier 16 , $G_1 i_b R_0$, is also negative and therefore must be subtracted from the driving signal s to increase the voltage $(s - G_1 i_b R_0)$ which is amplified by driving amplifier 12 with gain G_2 and then applied to electrostatic positioner 14 to increase the force of attraction between the two plates. This increased force of attraction opposes the separation velocity and thereby increases damping of the movable plate.

The voltage applied to the electrostatic positioner in FIG.1~~A~~ is: V.N 4/15/05

$E = G_2(s - G_1 i_b R_0)$ Eq.26

Degree of Damping Produced by the Invention

When the equation of forces of Eq.23 is rewritten with the value of E from Eq.26 the result is:

$Md^2r/dt^2 + Ddr/dt + K_T(r - r_0) = -a(CG_2/r)^2(s - G_1 i_b R_0)^2$ Eq.27

Substituting the value of i_b from Eq.20 the result is:

$Md^2r/dt^2 + Ddr/dt + K_T(r-r_0) = --a(CG_2/r)^2(s+G_1R_0E8.842x10^{-16}Ar^{-2}dr/dt)^2$

Eq.28

To simplify Eq.28 let $H = a(CG_2/r)^2$ Eq.29

and $J = G_1R_0E8.842x10^{-16}Ar^{-2}$ Eq.30

Then Eq.28 becomes:

$Md^2r/dt^2 + Ddr/dt + K_T(r - r_0) = -H(s + Jdr/dt)^2$ Eq.31

Expanding the right side of Eq.31 and rearranging like terms: